HYDAC INTERNATIONAL

Installations-, Betriebs- und Wartungshandbuch

Installation, Operation and Service Manual

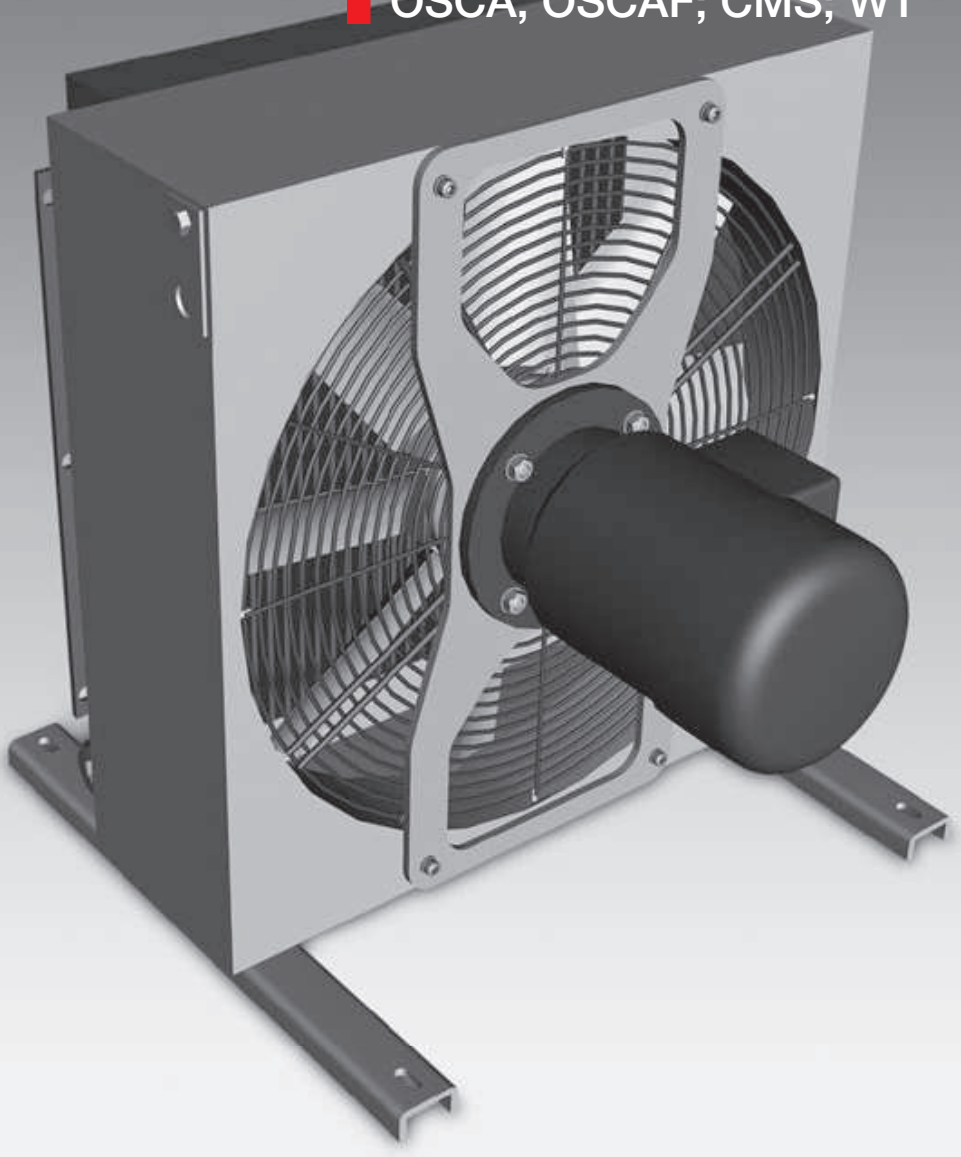
Installation, operation et service manual

Manuale di installazione, d'uso e di manutenzione

Instalación, funcionamiento y manual de mantenimiento

OK-EL, OKA-EL, OKAF-EL;
OK-ELC; OK-ELD; OK-ELH;
OK-EL MI; OK-P; SC, SCA, SCAF,
OSCA, OSCAF; CMS; WT

Production monitored
TÜV SÜD
Capacity EN 1048



D/E/F/I/SP 5.813.B0/06.11

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Einbauerklärung nach Maschinenrichtlinie 2006/42/ EG
Declaration of Incorporation acc. to Directive 2006/42/EG

Firma: **HYDAC AG – Zweigniederlassung Mezzovico**
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als Hersteller erklärt für folgendes Produkt (unvollständige Maschine):
as manufacturer declares for the following product (partly complete machinery):

Bezeichnung: *designation:*	Wärmetauscher Coolers	**Modell:** *model:*	OK-ELD, OK-EL, OKA-EL, OKAF-EL, OK-ELC, OK-ELH, SC, SCA, SCAF, OK-P, OSCA, OSCAF, CMS, WT, OK EL MI

dass die grundlegenden Anforderungen der o.g. Richtlinie anwendbar sind und – soweit für die unvollständige Maschine zutreffend - eingehalten werden.
that the essential requirements of the a.m. directive are applicable and – as far as applicable for the partly complete machinery – will be adhered.

Risikobeurteilung und -analyse werden nach Anhang I 2006/42/EG Artikel ausgeführt.
Risk assessment and analysis are implemented according to appendix I 2006/42/EG.

Die speziellen technischen Unterlagen gemäß Anhang VII Teil B Richtlinie 2006/42/EG wurden erstellt und werden der zuständigen Behörde auf begründetes Verlangen elektronisch übermittelt.
Relevant technical documentation in accordance with appendix VII part B directive 2006/42/EG were provided and are conveyed electronically to the responsible authority on justified demand.

Die Inbetriebnahme ist so lange untersagt bis festgestellt ist, dass die Maschine, in die die unvollständige Maschine eingebaut werden soll, den Bestimmungen der o.g. Richtlinien entspricht.
The operating is not permitted until it is ascertained that the machine, into which the partly complete machinery is to be built in, corresponds to the regulations of the a.m. directives.

Bemerkungen */ Remarks:*

Folgende Anforderungen der Richtlinie Maschinen (2006/42/EG) wurden berücksichtigt: Anhang I, Artikel 1.1.2, 1.1.3, 1.1.5, 1.2.1, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.6, 1.3.7, 1.3.8.1, 1.3.8.2 1.4.1, 1.4.2.1, 1.5.2, 1.5.4, 1.5.5 und 1.5.9.

According to the machinery directive (2006/42/EG) : appendix I, articles 1.1.2, 1.1.3, 1.1.5, 1.2.1, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.6, 1.3.7, 1.3.8.1, 1.3.8.2 1.4.1, 1.4.2.1, 1.5.2, 1.5.4, 1.5.5 und 1.5.9.

Dokumentationsbevollmächtigter */ Representative for documentation:*

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Ausstellungsort:/-datum Mezzovico, 01.01.2011
place / date

Funktion des Unterzeichners General Managers
role of signee:

Name des Unterzeichners: Dr P. Fenyo - Erich Bär
name:

Unterschrift:
signature:

Remark:
This declaration is a translation of the English original edition. In case of any conflicts, the English version shall prevail.

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Installation, Operation and Service Manual

For Cooler Types:

OK-EL, OKA-EL, OKAF-EL; OK-ELC; OK-ELD; OK-ELH; OK-EL MI; OK-P; SC, SCA, SCAF, OSCA, OSCAF; CMS; WT

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1. INTRODUCTION

This manual is a guide for the installation, maintenance and operation of HYDAC coolers.

To obtain the maximum efficiency, optimize the performance and prevent incorrect use, we strongly recommend that this entire manual is read carefully and all safety precautions are implemented before starting installation and putting the cooler into service. This manual must be available at all times: it is a part of the product. If lost, the manual should be replaced immediately.

The cooler may not be used for any purpose other than cooling fluids in accordance with the guidelines and instructions set out in this manual.

This manual illustrates a typical installation procedure for a cooler. Some common options are also included. Refer to separate installation drawings for additional optional equipment. Review all manuals and drawings prior to assembly. These documents are located inside the cooler packing carton. Contact your HYDAC sales representative if questions arise.

2. SYMBOLS

ATTENTION

Failure to follow the indicated instruction can endanger personal safety.

WARNING

In addition to possible serious injury or death, failure to follow the indicated instruction may cause damage to equipment.

DANGER

Failure to follow the indicated instruction may result in serious injury or death.

3. PREPARING FOR INSTALLATION

HANDLING THE UNIT:

ATTENTION

Sharp edges, splinters and exposed fasteners can cause injuries.
Only properly trained and qualified technicians wearing appropriate headgear, gloves and shoes, should move, lift, unpack, or prepare the unit for installation.

WARNING

Risk of handling a unit heavier than 25kg (55lb): improper lifting can cause injuries and equipment damage.
A lifting device or two properly trained & qualified persons are required to lift or move the cooler.

When unpacking and handling the unit, exercise extra care to prevent damage.

HYDAC recommends using a forklift or pallet jack to lift and move the cooler while it is still in its packaging. If multiple units are delivered, they can be shipped on the same pallet. A pallet jack will be required to move these units to the installation location.

Do not move the pallet without lifting it, otherwise it may be damaged.

- If using a forklift or pallet jack, ensure that the fork length is suitable to safely move the packaged unit.
- HYDAC recommends that the unit is kept in the protective packaging until it has been moved to the installation site.
- Do not lift the unit any higher than 0.15m (6 in) while moving it. If it must be lifted higher than 0.15m (6 in), exercise great care and keep all persons who are not involved in moving the unit at least 5m (16 ft) away.
- Do not use devices other than those already described to handle the cooler.

UNPACKING HYDAC COOLERS:

Do not unpack HYDAC coolers before moving them to their final installation location.

Once at the location:

1 – Cut the plastic straps;

2 – Open the packing carton on the opening side;

3 – Remove all protective material from the package;

4 – A properly trained person can now lift the cooler from the package and install it.

WARNING

For units heavier than 25kg (55lb) there is the risk of them falling over, causing personal injury or property damage.
Do not leave a cooler standing unattended on its side or end without adequate support to prevent it from falling over. The cooler must be stabilized at all times or laid flat on protective material until it is installed.

4. INSTALLATION

NOTE:

Improper installation can cause equipment damage. HYDAC coolers must be installed by properly trained and qualified personnel. Any operating personnel must be instructed according to this manual.

No cutting or drilling operations are necessary in order to install the cooler.

The cooler should preferably be installed vertically on the mounting feet. This is the recommended configuration. Other configurations must be discussed with HYDAC.

If strong vibration is expected during operation (particularly on mobile applications), the cooler must be decoupled from the machine as far as possible with suitable shock absorber elements and by using flexible connections (see the Accessories Catalogue).

The cooler should be fixed to a stable surface, using the bolt holes in the feet or in the cooling element.

Unrestricted airflow should always be ensured. Please refer to the dimensions W1 & W2 in the product catalogues for recommended clearances for the air inlet and outlet.

In closed rooms sufficient ventilation must be provided to prevent a rise in room temperature as a result of heated air dispelled by the cooler.

In case of doubt, ventilation between the cooler and the outside air should be assured by installing ventilation ducts. The size of the ducts must correspond at least to the frontal area of the cooler.

Inappropriate location of the cooler could reduce cooling capacity and increase noise level.

If mounted in a contaminated environment (dust, oil, etc.) dirt will accumulate on the cooling surface, therefore reducing cooling performance. In this case frequent cleaning must be carried out.

Connect the cooling element using flexible hydraulic hoses and hydraulic threaded connections. The inlet and outlet of the hydraulic connections are clearly labeled (IN & OUT). Make sure that all connections and hoses are sized according to the working parameters: pressure, flow, temperature and type of fluid.

Please refer to Table 1 for the max. permitted torque rating on all the available threaded connections.

If the unit is installed outside, sufficient protection against the weather should be provided; electric motors in particular must be protected against climatic influences.

COOLERS WITH PUMP:

The maximum suction pressure for coolers fitted with pumps is 0.4 bar. Please ensure adequate sizing of the suction pipe hose for this value (internal diameter, length and pressure drop).

The coolers should be installed close to the tank level (or below). Installations above the tank level (> 2.5 m) are possible but must be discussed with HYDAC.

ATTENTION
PLEASE NOTE: UNITS WITH PUMPS MUST NEVER OPERATE WITH CLOSED CONNECTIONS.
A short dry run with open connections (to check the direction of rotation) will not cause any damage.

COOLERS WITH HYDRAULIC MOTOR:

The hydraulic motor has a drain port which must be connected to the tank.

COOLERS WITH DC MOTOR:

Check the correct electrical connection, positive and negative, as indicated on the connectors and the applicable voltage. The current draw at nominal voltage values, the recommended fuse and the IP protection are indicated in the product catalogue.

ATTENTION
Please ensure that voltage and frequency correspond to the information on the label.

For the ELD and CMS series the power supply must be rectified and stabilized in order to achieve the maximum service life.

The product must be powered with the nominal voltage that is ±10 % of the recommended voltage (12 V - 24 V DC), with a residual ripple value lower than 1.0 %.

COOLERS WITH 3PH AND 1PH MOTOR:

The 3-phase motors for the OK / OKA / OKAF-EL, OK-EL MI, SC / SCA / SCAF, OSCA / OSCAF series are multi-voltage, 50 / 60Hz with protection class IP55.

The single-phase and 3-phase motors of the ELC series are single-voltage, 50Hz or 60Hz, with protection class IP55.

The electrical connection must be made according to the regulations of the country of installation and the information within the electric motor terminal box.

5. OPERATING CONDITIONS

The following operating conditions should never be exceeded:

- Min. / Max. process liquid temperature:
  +20 to +130 °C
- Min. / Max. ambient temperature:
  -20 to +40 °C for standard coolers
- Viscosity: See product catalogue in accordance with the configuration
- Max. dynamic working pressure for oil coolers:
  please refer to the data label on the cooler.
- Cleanliness class ISO 4406-1999 – 17/15/12 (NAS 6).

To reduce the effect of pressure peaks and/or cold start problems on the cooling element, optional devices [IBP/IBT] can be used together with special cooling elements (see Accessories Catalogue).

ATTENTION
These devices cannot provide complete protection for the cooling element. The customer must check that pressure peaks do not exceed the values indicated above.

WARNING
The product must not be subject to vibration levels exceeding 4.5 mm/s on each axis.

6. BEFORE START-UP

Before starting the cooler:

- Check that the cooler is securely mounted and correctly connected.
- Check that all cooler parts are free from damage.
- Check that the fan rotates freely.
- Check that inside the housing there are no parts that could be thrown around and cause injuries to persons or damage to property.
- Check that all electrical connections are made according to the motor data sheet (inside the terminal box).
- Check that the cooler is fitted with an earthing system.
- Check that hoses are properly attached and tight (refer to Table 1 for the max. permitted torque rating on the threaded connections).

HYDAC recommends the following:

- Operate the cooler only with fluids listed under §10.
- Filter the fluid before it passes through the cooler.

7. AT START-UP

Ensure:

- The correct fan rotation as indicated on the adhesive label on the housing.

  Incorrect rotation may damage the cooler permanently and / or reduce its cooling capacity.

- The correct air flow direction as indicated on the label on the housing.
- That the hoses are properly attached with no leaks.
- The correct voltage, current absorption, frequency, operating system pressure where applicable.
- That the cooler is free from abnormal noise and vibrations.

8. DURING OPERATION

IMPORTANT:

The customer must ensure that the product is used according to this manual.

The customer must check that once the cooler is installed and running, the operating conditions of the cooler correspond to the specified values and are not exceeded.

WARNING
It is not permitted to use HYDAC coolers in potentially explosive areas, unless the coolers have adequate ATEX certification.

DANGER
Disregarding the warning above can cause danger to life & limb and damage to the system.

ATTENTION
Risk of severe burns. The cooler can become extremely hot during operation. Ensure that the unit is cool before touching.

Do not overload the electric motor (see label on the electric motor).

Wear ear protection when standing in the immediate vicinity of a running cooler for long periods of time.

9. MONITORING

Check the specified temperatures of the fluid after commissioning. If these values are not stable and the system reaches excessive temperatures, please check the following:

- Fan direction of rotation (fan rpm if possible)
- Electrical connections
- Thermostats and pressure bypass valves
- Cooling air flow and direction (if possible)
- Fluid flow rate
- I/O temperatures of fluid and air
- Cleanliness of the cooling element surfaces
- Maximum pressure of the system

10. FLUID COMPATIBILITY

OIL

Mineral: HL / HLP / HLVP according to DIN 51524

Synthetic: MIL-H, SKYDROL, EHC according to CETOP RP 77H

High viscosity: HFD

Ecological: HETG / HEPG / HEE according to CETOP RP 77H

Phosphate ester: HFD-R, HFD-U according to CETOP RP 77H

WATER

Oil-water: HFA according to CETOP RP 77H

Water-oil: HFB according to CETOP RP 77H

Water / glycol: HFC according to CETOP RP 77H

ATTENTION

For all other fluids please contact our Technical Department. For coolers equipped with pump and pump & filter respectively OKA, OKAF, SCA, SCAF, OSCA, OSCAF, please contact the Technical Department before using the above-mentioned fluids.

ATTENTION

For all mixture percentages HFA, HFB, HFC please contact our Technical Department.

11. MAINTENANCE AND CLEANING

HYDAC coolers generally require low maintenance if installed and used properly. The following instructions are only a guideline, as individual operating conditions will determine the appropriate interval for cleaning and maintenance.

PREVENTIVE MAINTENANCE

The following preventive maintenance should be carried out at regular intervals to ensure long lifetime:

- Check the cooler is not damaged. Replace damaged components immediately (contact our After Sales Department).
- Check for abnormal noise or unusual vibrations.
- Ensure the cooler is securely mounted.
- Check the mounting bolts are securely tightened.
- Ensure that the cooler is free from leaks. Damaged cores or damaged seals must be replaced or repaired immediately.
- Make sure that the warning labels are in good condition. Replace any damaged / missing label immediately.
- Check the electrical installation. This must be done by a qualified electrician only.
- Check the cleanliness of the cooling element. Dust, debris, etc. will reduce the cooling capacity. Clean the cooler if necessary.

CLEANING

Air side

A dusty environment might necessitate periodic cleaning of the heat exchanger. A contaminated / clogged cooling element leads to a reduction of the cooling capacity. Its condition should be checked as part of daily / weekly / monthly inspection.

ATTENTION
Risk of injury.
Prior to cleaning, disconnect all power supplies to the motor.

ATTENTION
The cooler might be hot! Please allow it cool down before cleaning.
The cooling element can be cleaned with a soft brush, compressed air or water jet.

ATTENTION
Be careful not to damage the air-fins of the element.
This reduces the performance of the unit.

When cleaning the exterior of the cooler using water, disconnect from power supply. Comply with the electric motor protection standard. Motor and electronic devices must be protected during the cleaning process.
The air fins of the core can be cleaned by blowing through with compressed air.
If necessary, a high-pressure washing system and degreasing agent can be used.
A pressure washer must be set to moderate working pressure and the water jet stream should be directed parallel to the cooling air fins (vertical to the cooler face area) to prevent any damage.
Cleaning agents can increase the cleaning effect. Please note that any detergent must be compatible with aluminum.

Filter side

OKAF, SCAF, OSCAF coolers are fitted with an oil-filter element. Its contamination must be monitored. Please refer to the oil-filter instruction manual for cleaning and changing instructions.

12. ACCESSORIES

On customer request, various accessories (e.g. AITR, AITF, AITF RS, AITF RE, AITF SS, IBP/IBT, FU, GP, ESC, EL.BOX) can be mounted on HYDAC coolers.

For further technical details and available accessories, for each cooler type, please refer to our Accessories Catalogue, available on request.

13. STORAGE

HYDAC coolers must be stored in dry conditions (constant temperature and constant humidity).

Fluctuations in temperature from cold to warm and vice versa must be avoided. This may result in condensation and cause potential corrosion problems.

When storing for less than one year, we recommend flushing inside the cooling element with a suitable preserving fluid which is compatible with aluminum (see §10). Take into account the intended operating fluid. Always seal the ports.

When storing for more than one year, HYDAC recommends filling the cooler with a preserving fluid and sealing the ports. The preserving fluid (see §10) must be removed completely before using the cooler again. If necessary use a suitable cleaning agent.

Table 1: Max. permitted torque rating on the threaded connections

Thread Type	Torque [Nm]
¼" G	40
½" G	100
¾" G	140
1" G	220
1¼" G	300
1½" G	340
2" G	440
M6 x 1,0	10
M8 x 1,0	20
M10 x 1,0	20
M12 x 1,5	30
M14 x 1,5	50
M22 x 1,5	150

14. DISCLAIMER

ATTENTION

The operating conditions and installation instructions described in this manual are the basis for safe working practice and should not be deviated from without HYDAC's permission.

HYDAC is not responsible for any damage due to external causes, including but not limited to, improper use, problems with electrical power, accident, neglect, alteration, repair, improper installation, or improper testing.

Any change to the product shall invalidate the warranty.

ATTENTION

If HYDAC labels and marks are removed or become illegible then all warranty claims shall be invalid. HYDAC labels may not be changed or removed. The customer must ensure traceability.

HYDAC reserves the right to make technical modifications without prior notice.

IMPORTANT:
Please contact us in case of faults.
To resolve faults without our prior written consent shall invalidate the warranty.

Check that the connections are correct and the oil is flowing freely.

15. QUALITY TEST REPORTS

All HYDAC cooler units are subject to a final quality test.
The quality test report is available on written request.

16. WARRANTY AND NOTIFICATION OF FAULTS

All coolers sold are subject to the HYDAC "GENERAL CONDITIONS OF SALE AND DELIVERY".

Any notification of fault under warranty should be advised in writing using the "HYDAC Complaints Form Q002" available on request.

We will not accept liability for improper usage.
Any changes and / or repairs carried out on products in order to resolve faults without our prior written consent shall invalidate the warranty.